YEVGRAFOV, M. A.

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Mathematical Reviews
June 1954
Analysis

Evgrafov, M. A. On completeness of systems of analytic functions near to $\{z^n P(z)\}$, $\{[\varphi(z)]^n\}$, and on some interpolation problems. Izvestiya Akad. Nauk SSSR. Ser. Mat. 17, 421–460 (1953). (Russian)

Let $R=R(D)$ be the class of functions regular in a domain D. The following 3 properties of a set $\{f_n(z)\}$ $(f_n \in R)$ are discussed: (A) every $f \in R$ is an uniform limit of finite linear combinations of the f_n in every closed $F \subset D$. (B) every $f \in R$ is equal to a series $\sum a_n f_n(z)$ (convergence uniform in $F \subset D$). (C) same as (B) with uniform convergence replaced by uniform summability by a matrix method of summation. Let $F(z, \zeta) = \sum_{n=0}^{\infty} f_n(z)\zeta^{-n-1}$. If the integral equation (1) $f(z) = (2\pi i)^{-1} \int_{|\zeta|=r} F(z, \zeta) g(\zeta) d\zeta$ has a solution $g(\zeta)$ for every $f \in R$ and if the series for F is uniformly convergent (or summable) in D, then term-by-term integration yields that $\{f_n(z)\} \in$ (B) (or (C)). If $f_n(z) = z^n p(z) + z^{n+1} k_n(z)$ (k_n regular in $|z| < R$), then $F(z, \zeta) = p(z)/(\zeta - z) + K(z, \zeta)$, say. If K satisfies some conditions allowing the application of the standard theory of integral equations, then we have Theorem 1: $\{f_n(z)\} \in$ (B) in $|z| < |\alpha|$, where α is the zero of $p(z)$ closest to the origin. There is a set of functions $h_k(z)$ associated with the zeros α_k of $p(z)$ such that h_k is regular in $|z| > \alpha_k$ and such that those, and only those, functions satisfying $\int f(z) h_k(z) dz = 0$ (integration ... $k = 1, 2, \ldots, m-1$, can be expanded ... $< R$. Theorem 2. If D is a domain containing the origin and not containing the α, then $\{f_n(z)\} \in$ ... in D. Let $\varphi(z) \in R(|z| < \rho)$, $\varphi(0) = 0$, $\varphi'(0) = 1$. If

$$f_n(z) = (\varphi(z))^n + z^{n+1} k_n(z)$$

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[illegible] assumptions on [illegible]

[illegible] D and k [illegible]

[illegible] there [illegible]

yields [illegible]

[illegible] then [illegible] the e_k are

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EVGRAFOV, M. A.

certain polynomials. $|\omega_0| - \epsilon$ can not be replaced by $|\omega_0| + \epsilon$. Setting $L_n(F) = F^{(n)}(n + \lambda_n)$, $\varphi(z, \zeta) = e^{z\zeta}$ gives Theorem 5. If all singularities of $f(z) = \sum a_n z^{-n-1}$ are inside the domain $|ze^z| < 1/e$ which contains the origin and if $\sum |\lambda_n|^2 < \infty$, then $F(z) = \sum_{n=0}^{\infty} a_n z^n / n! = \sum F^{(n)}(n + \lambda_n) p_n(z)$, where the $p_n(z)$ are certain polynomials. The choice $L_n(F) = F^{(n)}((-1)^n + \lambda_n)$, $\varphi(z, \zeta) = e^{z\zeta}$ gives Theorem 6. Suppose $\sum |\lambda_n|^2 < \infty$. If $F(z)$ is an entire function of order one, type $< \pi/4$, then

$$F(z) = \sum F^{(n)}((C-1)^n + \lambda_n) q_n(z),$$

where the $q_n(z)$ are polynomials. For every $k > \pi/4$ there is an entire function $G(z)$ of order one, type k such that $G^{(n)}((C-1)^n + \lambda_n) = 0$. *W. H. J. Fuchs* (Ithaca, N. Y.).

YEVGRAFOV, M. A.

Mathematical Reviews
May 1954
Analysis

Evgrafov, M. A. On completeness of certain systems of polynomials. Mat. Sbornik N.S. 33(75), 433-440 (1953). (Russian)

Let

$$p(z)=1+a_1z+\cdots+a_kz^k=\sum_{j=1}^{k}(1-z\lambda_j^{-1}),$$
$$|\lambda_1|<|\lambda_2|<\cdots<|\lambda_k|,\quad a_j\neq 0.$$

The author investigates the closure of $\{z^n p_n(z)\}$ in the set of functions regular in $|z|<r$. Here $p_n(z)$ is a polynomial of degree k with non-vanishing coefficients, and $p_n(z)\to p(z)$ as $n\to\infty$. It is shown that associated with every λ_j there is a power series $F_j(z)=\sum c_j(n)z^{-n-1}$, convergent in $|z|>|\lambda_j|$, such that the linear functional $l_j(f(z))=\int F_j(z)f(z)dz$ (integration along $|z|=|\lambda_j|+\epsilon$) vanishes for $f(z)=z^n p_n(z)$. Theorem. Let $f(z)$ be regular in $|z|<r$, $l_1(f)=\cdots=l_{m-1}(f)=0$, $l_m(f)\neq 0$, and $|\lambda_m|<r$; then there is a convergent expansion $f(z)=\sum_{n=0}^{\infty}b_nz^np_n(z)$ $(|z|<|\lambda_m|)$. If $l_j(f)=0$ for all j with $|\lambda_j|<r$, then the expansion converges in $|z|<r$.

W. H. J. Fuchs.

YEVGRAFOV, M.A.

USSR/Mathematics - Interpolation

FD-1407

Card 1/1 : Pub. 47 - 4/6

Author : Yevgrafov, M. A.

Title : A recursive relation connected with the Abel-Goncharov interpolation problem

Periodical : Izv. AN SSSR, Ser. mat., Vol 18, 449-460, Sep-Oct 1954

Abstract : The article derives a new recursive relation which makes it possible in several cases to give completely accurate evaluations for interpolation polynomials, mostly from below. Eight theorems and five lemmas are proved in the demonstration. The article was presented by Academician S. L. Sobolev.

Institution :

Submitted : July 1, 1953

YEVGRAFOV, M. A.

USSR/ [illegible]

Card : [illegible]

Authors : [illegible]

Title : [illegible] systems

Periodical : Dok. AN [illegible]

Abstract : [illegible]

YEVGRAFOV, Marat Andreyevich

(Moscow Physico-technical Inst) Academic degree of Doctor of Physico-mathematical Sciences, based on his defense, 28 June 1955, in the Council of the Moscow Order of Lenin and Order of Labor Red Banner State U imeni Lomonosov, of his dissertation entitled: "Method of related systems in the fields of analytical functions and its applications to interpolation."

Academic degree and/or title: Doctor of Sciences

SO: Decisions of VAK, List no. 24, 26 Nov 55, Byulleten' MVO SSSR, No. 20, Oct 57, Moscow, pp 22-24, Uncl. JPRS/NY-471

YEVGRAFOV, M. A.

USSR, [illegible]

Card [illegible]

Authors : [illegible]

Title : [illegible] spaces analytic [illegible] of the Poincare theorem [illegible]

Periodical : [illegible]

Abstract : [illegible] operators in the spaces of analytic [illegible] theorems [illegible]

(1953-1954).

problem for nodes located on a

11, 1959

is proved to show the conditions under which the

function $F(z)$. The $P_n(z)$ =

Institute

11, 1954

YEVGRAFOV, M.A.

SUBJECT USSR/MATHEMATICS/Functional analysis CARD 1/2 PG - 157

AUTHOR EVGRAFOV M.A.

TITLE The spectral theory of certain operators in the space of analytic functions.

PERIODICAL Doklady Akad. Nauk 105, 625-627 (1955)
reviewed 7/1956

In connection with his earlier paper (Doklady Akad. Nauk 101, No.4 (1955)) the author tries to establish a spectral theory for the operators A(F):

$$A(F) = \frac{1}{2\pi i}\int_{|\zeta|=r} k(z,\zeta)F(\zeta)d\zeta, \quad k(z,\zeta) = \sum_{n=0}^{\infty}\frac{\lambda_n z^n}{\zeta^{n+1}} + \sum_{n=0}^{\infty}\sum_{k=1}^{\infty}\varepsilon_{n,k}\frac{z^{k+n}}{\zeta^{n+1}}$$

$$\lim_{n\to\infty}\sum_{k=0}^{\infty}\varepsilon_{n,k}r^{k-n} = 0, \qquad 1-\eta<r<1,$$

where for simplicity all λ_n are assumed to be different. Some theorems are proved:

1. If the $a_m^{(n)}$, m=0,1,... satisfy the condition

$$(\lambda_n - \lambda_{n+m})a_m^{(n)} = \sum_{k=0}^{m-1}\varepsilon_{n+k,m-k}a_k^{(n)} \qquad a_0^{(n)} = 1,$$

then the functions $\varphi_n(z) = z^n\sum_{m=0}^{\infty}a_m^{(n)}z^m$ satisfy the equation

$$\lambda_n \varphi_n(z) = \frac{1}{2\pi i} \int\limits_{|\zeta|=r} k(z,\zeta)\, \varphi_n(\zeta)\, d\zeta \qquad r<1$$

2. If the $b_m^{(n)}$, $m=0,1,\ldots,n$ satisfy the condition

$$(\lambda_n - \lambda_{n-m})\, b_m^{(n)} = \sum_{k=0}^{m-1} \varepsilon_{n-k-1,k+1}\, b_k^{(n)} \qquad b_0^{(n)} = 1,$$

then the functions
$$\psi_n(\zeta) = \sum_{m=0}^{n} \frac{b_m^{(n)}}{\zeta^{n-m+1}}$$

satisfy the equation

$$\lambda_n \psi_n(\zeta) = \frac{1}{2\pi i} \int\limits_{|z|=r} k(z,\zeta)\, \psi_n(z)\, dz$$

3. The systems of functions $\{\varphi_n(z)\}$ and $\{\psi_n(\zeta)\}$ are biorthogonal.

Furthermore it is proved that under certain further conditions the system of functions $\{\varphi_n(z)\}$ forms the basis in the space $\mathfrak{A}(|z|<r)$, $r<1$ and the system $\{\psi_n(z)\}$ forms the basis in the space $\mathfrak{A}(|\zeta|>r)$, $r<1$.

YEVGRAFOV, M.A.

On a certain test of basis in linear topological spaces. Dokl.AN SSSR 107 no.2:199-201 Mr '56. (MIRA 9:7)

1.Predstavleno akademikom I.M.Vinogradovym.
(Topology)

YEVGRAFOV, M.A.

SUBJECT USSR/MATHEMATICS/Functional analysis CARD 1/2 PG - 380
AUTHOR EVGRAFOV M.A.
TITLE The completeness of a system of eigenfunctions of a certain class of operators in the linear topological space with a non-countable basis.
PERIODICAL Doklady Akad. Nauk 108, 13-15 (1956)
reviewed 11/1956

Let the linear topological space $\mathfrak{A}(\sigma(r))$ consist of the functions $f(x)$ defined on $(0,\infty)$ which satisfy the condition $\int_0^\infty |f(x)| e^{-xr} dx = e^{O(\sigma(r))}$. A topology is given by the notion of convergence $f_N \to 0$ if $\int_0^\infty |f_N(x)| e^{-xr} dx \leq$ $\leq \varepsilon_N e^{\delta_N \sigma(r)}$, $\varepsilon_N \to 0$, $\delta_N \to 0$. Here for $r \to 0$, $\sigma(r)$ tends quicker to infinity than $\ln \frac{1}{r}$ and $f(x)$ has no worse singularities than the δ-function. In $\mathfrak{A}(\sigma(r))$ the operators $A(F(x)) = \varrho(x)F(x) + \int_0^x \varepsilon_\lambda(x)F(\lambda)d\lambda$ and $A^*(F(x)) = \varrho(x)F(x) + \int_x^\infty \varepsilon_x(\lambda)F(\lambda)d\lambda$ are considered. $\varrho(x)$ is assumed to be continuously differentiable, besides $\varrho'(x) \neq 0$ and $\varrho(x_1) \neq \varrho(x_2)$ if $x_1 \neq x_2$. For

Doklady Akad. Nauk 108, 13-15 (1956) CARD 2/2 PG - 380

these operators several spectral theoretical results are formulated without proof: 1. If $\mathcal{E}_{\lambda}(x)$ satisfies certain conditions, then in $\mathfrak{A}(\sigma(r))$ for an arbitrary $\mu > 0$ there exists a single function $\varphi_{\mu}(x) = \delta(x-\mu)+a_{\mu}(x)$; $a_{\mu}(x)=0$, $x < \mu$, which satisfies the equation $A(\varphi_{\mu}(x)) = \varrho(\mu)\,\varphi_{\mu}(x)$; likewise there exists a single function $\psi_{\mu}(x) = \delta(x-\mu)+b_{\mu}(x)$; $b_{\mu}(x)=0$, $x > \mu$ which satisfies the equation $A^{*}(\psi_{\mu}(x)) = \varrho(\mu)\,\psi_{\mu}(x)$. 2. The systems of functions $\{\varphi_{\mu}(x)\}$ and $\{\psi_{\mu}(x)\}$ are biorthogonal:

$$\int_{0}^{\infty}\varphi_{\mu}(x)\cdot\psi_{\nu}(x)\,dx = \delta(\mu-\nu).$$

3. For the functions $a_{\mu}(x)$ and $b_{\mu}(x)$ estimations are given. 4. If these estimations satisfy certain conditions, then the system $\{\varphi_{\mu}(x)\}$ forms a basis in $\mathfrak{A}(\sigma(r))$.
The formulated results are extensions of the author's theorems 1.-4. in Doklady Akad. Nauk 105, 625-627 (1956) to the case of a non-countable basis.

INSTITUTION: Phyro-technical Institute, Moscow.

YEVGRAFOV, M.A.

AUTHOR: Yevgrafov, M. A.

TITLE: Asymptotic Evaluations and Entire Functions (Asimptoticheskiye otsenki i tselyye funktsii)

PUB. DATA: Gosudarstvennoye izdatel'stvo tekhniko- teoreticheskoy literatury, Moscow, 1957, 158 pp., 4,000 copies

ORIG. AGENCY: None

EDITORS: Solov'yev, A. D. and Tikhonova, E. P.; Tech. Ed.: Murasheva, N. Ya.; Reviewer: Bakulova, A. S.

PURPOSE: The book is a monograph concerning asymptotic evaluations. It is not designed as a textbook.

COVERAGE: Most asymptotic evaluations are derived using special properties of a problem. The author believes that it is better to use available general methods which must first be classified and generalized. He does not expect to solve all problems using general methods, but thinks

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many of them could be solved more simply and more completely. The book consists of three chapters. The author takes four examples and shows how asymptotic evaluations of the functions are obtained; he thus introduces the concepts of asymptotic evaluation and of asymptotic series. After this introduction, he gives four methods for asymptotic evaluation indicated in the Table of Contents. Each method deals with a certain type of function. Formulas for asymptotic evaluation are derived and the application of the formulas for some problems is given. Special consideration is paid to the method of Laplace and the method of steepest descent, which in the author's opinion can be widely applied. The asymptotic evaluation of entire functions, or of functions which can be expressed in terms of entire functions, are needed in many problems of analysis. The author gives the fundamentals of the theory of entire functions in connection with asymptotic evaluation in chapter two. He investigates the relationship between the behavior of entire functions in infinity and the basic elements of the entire function. The author investigates special cases of asymptotic evaluation of entire functions. He takes certain important examples and using the general methods given in chapter one, the theory of entire

Asymptotic Evaluations and Entire Functions (Cont.)

functions given in chapter two and some additional formulas, derives asymptotic evaluations of functions. The book deals with Russian contributions. There are 8 references of which 7 are in Russian (including 4 translations) and 1 French. The U.S.S.R. personalities mentioned include Lavrentyev, M. A., Shabat, B. V., Levin, B. Ya., and Markushevich, A. T.

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Asymptotic Evaluations and Entire Functions (Cont.)

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YEVGRAFOV, M.A.

Evaluating the growth of solution of a Volterra-type integral equation. Usp.mat.nauk 12 no.3:297-302 My-Je '57. (MIRA 10:10)
(Integral equations)

YEVGRAFOV, M.A.

SUBJECT USSR/MATHEMATICS/Functional analysis CARD 1/4 PG - 909
AUTHOR EVGRAFOV M.A.
TITLE Linear operators in the space of analytic functions of several variables.
PERIODICAL Izvestija Akad.Nauk 21, 223-234 (1957)
reviewed 7/1957

The space $\mathfrak{A}_R^k$ ($\mathfrak{A}_R^k$) is the set of analytic functions of the k variables $z_1, z_2, \ldots, z_k$ which are regular for $|z_i| < R$ ($|z_i| \geqslant R$), $i=1,2,\ldots,k$. The convergence is understood as a uniform convergence. In $\mathfrak{A}_R^k$ and $\bar{\mathfrak{A}}_R^k$ the basis and biorthogonality are defined usually. We denote $F(z_1,\ldots,z_k) = F(z)$; $z_1^{m_1},\ldots,z_k^{m_k} = z^m$ etc. Linear operators in $\mathfrak{A}_R^k$ and $\bar{\mathfrak{A}}_R^k$ are defined by the functions $\varphi_m(z) = Az^m$, $m_i = 0,1,\ldots$, $i=1,2,\ldots,k$ or $\psi_m(z) = Bz^{-m-1}$, $m_i=0,1,2,\ldots$, $i=1,2,\ldots,k$. If the linear operator A is defined in $\mathfrak{A}_R^k$ by $Az^m = \varphi_m(z) = \sum_{n=0}^{\infty} a_{m,n} z^n$, then the operator defined by $A'z^{-m-1} = \psi_m(z) = \sum_{n=0}^{\infty} a_{n,m} z^{-n-1}$

Izvestija Akad.Nauk 21, 223-234 (1957) CARD 2/4 PG - 909

in $\bar{\mathfrak{A}}_R^k$ is denoted with A'. If A transfers the space $\mathfrak{A}_R^k$ into $\mathfrak{A}_R^k$, $R_o < R \leq R_1$, then the representation holds:

$$AF = \frac{1}{(2\pi i)^k} \int_{|\zeta_i| = r} \cdots \int A(z, \zeta) F(\zeta) d\zeta_1 \ldots d\zeta_k ,$$

where $A(z, \zeta)$ is an analytic function of z and ζ which is regular for $|z_i| < r$, $|\zeta_i| > r$, $R_o < r \leq R_1$. If A transfers $\mathfrak{A}_R^k$ into $\mathfrak{A}_R^k$, then A' transfers $\bar{\mathfrak{A}}_R^k$ into $\bar{\mathfrak{A}}_R^k$ ($R_o < R \leq R_1$) and

$$A'F = \frac{1}{(2\pi i)^k} \int_{|\zeta_i| = r} \cdots \int A(\zeta, z) F(\zeta) d\zeta_1 \ldots d\zeta_k .$$

If $\mathfrak{A}$ has an inverse operator in $\mathfrak{A}_R^k$ and the system $\{\varphi_m(z)\}$ forms a basis in $\mathfrak{A}_R^k$, then also $\{\varphi_m^{(1)}(z)\}$, $\varphi_m' = A\varphi_m$ forms a basis in $\mathfrak{A}_R^k$.

Let A be an operator in $\mathfrak{A}_R^k$: $Az^m = \varphi_m(z) = \sum_{n=0}^{\infty} \varepsilon_{m,n} z^n$ and let exist a number α , $0 < \alpha < 1$, such that

$$\sup_{\alpha \leqslant r < 1} \lim_{\max m_i \to \infty} \sum_{n=0}^{\infty} |\varepsilon_{m,n}| \, r^{n_1 + \ldots + n_k - m_1 - \ldots - m_k} = \varepsilon_1 .$$

Then for the operator equation $(A + \lambda E)F = G$ for $|\lambda| > \varepsilon_1$ all Fredholm theorems are valid.
Let F be a solution of $(E-A)F = G$,

$$f(z) = \sum_{m=0}^{\infty} a_m z^m, \quad G(z) = \sum_{m=0}^{\infty} b_m z^m$$

and let

$$g_0(r) = \sum_{m=0}^{\infty} |b_m| r^{m_1 + \ldots + m_k}, \quad \gamma_p(r) = \sup_{\max m_i \geqslant p} \sum_{n \geqslant m} |\varepsilon_{m,n}| r^{n_1 + \ldots + n_k - m_1 - \ldots - m_k}.$$

Then the estimation

$$\sum_{m=0}^{\infty} |a_m| r^{m_1+\dots+m_k} \leq g_0(r) \left\{1+ \gamma_1(r)+ \gamma_1(r)\, \gamma_2(r)+\dots\right\}$$

is valid.
The operator A which satisfies the condition

$$Az^m = \varphi_m(z) = \sum_{n \geqslant m} \varepsilon_{m,n}\, z^n$$

is called an operator of Volterra's type.
Finally the author gives a spectral theory for operators which differ from a diagonal operator only by an operator of Volterra's type.
The present paper in essential is a generalization of the author's results (Doklady Akad.Nauk 101, 597-600 (1955); ibid. 105, 625-627 (1955)) to the case of analytic functions of several variables.

AUTHOR YEVGRAFOV M.A., SOLOV'YEV A.D. PA - 3123
TITLE On A General Basis-Criterion.
(Ob odnom obshchem kriterii bazisa -Russian)
PERIODICAL Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 3, pp 493-496 (U.S.S.R.)
Received 6/1957 Reviewed 7/1957

ABSTRACT The system of the regular functions within the domain G $u_n(z) = z^n \varphi_n(z)$, $\varphi_n(0) = 1$, $n = 0,1,2,\dots$ is assumed to form a basis in the domain G_1 if each functions that is reguler in G_1 in this domain is represented by the convergent series $f(z) = \sum_{n=0}^{\infty} a_n u_n(z)$. This representation, by the way, is unique. The present paper contains three theorems and their proofs:

Theorem 1: Be it that the system given above is assumed, where the functions $\varphi_n(z)$ within the circle $|z|<R$ are supposed to be regular and different from zero. The above system is written down in the form $u_n(z)=z^n - \lambda_n(z)$ where the functions $\lambda_n(z)$ in the circle $|z|<R$ are regular. The author introduce the following denotations.

$\lambda_n(z) - \lambda_{n-1}(z) = \Delta_n(z) = \sum_{k=1}^{\infty} \Delta_{nk} z^k$, $\Delta_0(z) = \lambda_0(z)$

$\Delta_n^0(r) = \sum_{k=1}^{\infty} |\Delta_{nk}| r^k$, $l_n(r) = \sum_{k=0}^{\infty} \Delta_k^0 (r)$. If the functions $\lambda_n(z)$ satisfy the conditions $\lim_{n\to\infty} (l_n(r)/n)$ in the case of any $r<R$, the system written down

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above forms a basis in the circle $|z|<R$. Two corollaries are added to this theorem. Theorem 2: Be it that the system $u_n(z)=u^n(z)\psi_n(z)$, $\psi_n(0)=1, n=0,1..$ is assumed where $u(z)=z+\ldots$ - in the simple continuous domain G is a regular and single-leaf function. The function $u(z)$ is represented by the function $u(\zeta)$ on a circle with the origin as center. In the domain G the function $\psi_n(z)$ are regular and in each closed amount $E\subset G$ only a finite number of these functions is assumed to have zeros. The authors here put

$l_n(E)=\sum_{k=k_0}^{n} \max_{z\in E} \left| \ln \left[\frac{\psi_{k-1}(z)}{\psi_k(z)} \right] \right|$ $(E<G)$ is a closed amount and $k_0=k_0(E)$ applies.

If at any $E\subset G$ $\lim_{n=\infty}(l_n(E)/n)=0$ applies, the system $u_n(z)=u^n(z)\psi_n(z)$, $\psi_n(0)=1$, $n=0,1,\ldots$ forms a basis in the domain G.

Theorem 3: follows from the theorem 1 by the replacement of the conditions contained there in by others.

(No illustrations)

ASSOCIATION

PRESENTED BY KOLMOGOROV, Member of the Academy

SUBMITTED 12.10.1956

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Card 2/2

20-114-6-4/54

AUTHORS: Yevgrafov, M. A., Solov'yev, A. D.

TITLE: A Class of Reversible Operators in a Ring of Analytical Functions (Ob odnom klasse obratimykh operatorov v kol'tse analiticheskikh funktsiy)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 114, Nr 6, pp. 1153-1154 (USSR)

ABSTRACT: $K_m(r_i, R_i) = K_m$ here designates a ring of analytical functions of the complex variables $z_1, z_2, \dots z_m$, which are regular and unique in the case of $r_i < |z_i| < R_i$, $i = 1, 2, \dots m$. In this ring the topology is assumed by the concept of convergence as a uniform convergence in the case of $r_i(1 + \varepsilon) < |z_i| < R_i(1 - \varepsilon)$ for any values $\varepsilon > 0$. Like in the case of some previous papers by these authors the following can be shown: If K_m is only considered as a linear topological space, the following applies:
Theorem 1: A is a linear operator in K_m which is defined by the equations

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A Class of Reversible Operators in a Ring of Analyitical Functions

$Az_1^{n_1} \dots z_m^{n_m} = Z_1^{n_1} \dots Z_m^{n_m} \quad \varepsilon n_1 \dots n_m (Z_1 \dots Z_m),$

$-\infty < n_1, \dots n_m < \infty$

In this case $\varepsilon_{n_1 \dots n_m} (Z_1, \dots Z_m) \rightarrow 0$ at

$\max_i |n_i| \rightarrow \infty$ (in the sense of topology K_m) holds good.

The operator $E + \lambda A$ then has an inverse operator which is constant in K_m and which has no limit points for all λ (with the exception of a countable quantity of eigenvalues) within a finite part of the plane. In this connection the multiple quality of every eigenvalue is finite and with a suitable definition of the operator all of Fredholm's alternatives apply.

Theorem 2: gives an immaterial generalization of this result. If K_m is not considered a linear topological space but a topological ring, a considerably more marked result may be obtained. There are 3 references, 3 of which are Slavic.

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20-114-6-4/54

A Class of Reversible Operators in a Ring of Analytical Functions

ASSOCIATION: Department for Applied Mathematics of the Mathematical Institute imeni V. A. Steklov of the AS USSR (Otdeleniye prikladnoy matematiki Matematicheskogo instituta im. V. A. Steklova Akademii nauk SSSR)

PRESENTED: January 18, 1957, by M. V. Keldysh, Member of the Academy

SUBMITTED: January 17, 1957

Card 3/3

AUTHOR: Yevgrafov, M.A. SOV/20-121-1-6/55

TITLE: On the Asymptotic Behavior of the Solutions of Difference Equations (Ob asimptoticheskom povedenii resheniy raznostnykh uravneniy)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 1, pp 26-29 (USSR)

ABSTRACT: Let the coefficients of the equation

$$(1) \qquad y(n+k) + \sum_{m=1}^{k} a_m(n)y(n+k-m) = 0$$

satisfy the conditions:

$$a_k(n) \neq 0, \quad n \geqslant 1; \quad \lim_{n\to\infty} a_m(n) = a_m, \quad \sum^{\infty} |a_m(n+1)-a_m(n)| < \infty$$

$$(m=1,2,\dots,k)$$

$$\lambda^k + a_1\lambda^{k-1} + \dots + a_k = (\lambda-\lambda_1)\dots\dots(\lambda-\lambda_k), \quad \lambda_i \neq \lambda_j, \quad \lambda_i \neq 0$$

$$(i,j=1,2,\dots,k).$$

Let $P_n(\lambda) = \lambda^k + a_1(n)\lambda^{k-1} + \dots + a_k(n) = (\lambda-\lambda_1(n))\dots(\lambda-\lambda_k(n))$

$$\lim_{n\to\infty} \lambda_m(n) = \lambda_m.$$

Then every solution of (1) has the form

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On the Asymptotic Behavior of the Solutions of Difference Equations SOV/20-121-1-6/55

$$y(n) = C_1 y_1(n) + \dots + C_k y_k(n),$$

where $y_m(n) \sim \lambda_m^{-1}(1) \dots \lambda_m^{-1}(n)$, $n \to \infty$.

An analogous result holds for systems of difference equations. In both cases a generalization to the case, where the $\lambda_m(n)$ tend to ∞ or 0, is possible. Further analogous results relate to systems of infinite order and to certain integral equations and differential equations. Altogether there are seven theorems. There are 6 Soviet references.

PRESENTED: February 10, 1958, by M.V.Keldysh, Academician

SUBMITTED: February 8, 1958

1. Mathematics

Card 2/2

AUTHOR: Yevgrafov, M.A. SOV/20-121-3-3/47

TITLE: On the Asymptotic Behavior of the Solutions of Linear Systems of Equations (Ob asimptoticheskom povedenii resheniy sistem lineynykh uravneniy)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 3, pp 407-410 (USSR)

ABSTRACT: Let the functions

$$P_n(z) = \sum_{m=-n+1}^{\infty} a_m^{(n)} z^m, \quad 0 < |z| < d_n, \quad n = 1,2,\dots$$

satisfy the following conditions:

1. There exist sequences ϱ_n and R_n, $\varrho_n < R_n$, so that

$$\lim_{n\to\infty} \max_{|z|=1} \left| \frac{P_{n+1}\left(\frac{z}{R_{n+1}}\right)}{P_n\left(\frac{z}{R_n}\right)} \right| = \lim_{n\to\infty} \max_{|z|=1} \left| \frac{P_{n+1}\left(\frac{z}{\varrho_{n+1}}\right)}{P_n\left(\frac{z}{\varrho_n}\right)} \right| = 1$$

It exists an r_n, $\varrho_n < r_n < R_n$, so that $P_n(z) \neq 0$ for $|z| = r_n$ and that the variation of $\arg P_n(z)$ on $|z| = r_n$ is equal

Card 1/4

Determination of the Class of Convergence in Certain Interpolation 20-1-7/54
Problems.

E with regard to z is uniform. In this connection certain restrictions of increase and very strong restrictions of smoothness are imposed to the sequence λ_n. These conditions are given here. With the aid of some lemmata given here the author obtains the following final result: The function defined by the equations $\lim_{n\to\infty}((v_{n+1}(z)/v_n(z)) = v(z)$ and $v(z) = u(\xi(z))\exp\left\{\frac{1}{\varsigma}\varphi(\xi(z))\right\}$ is regular and one-leaved in the star-like domain $K < E$, which is depicted on a circle by the function $w = v(z)$. When the integer function $F(z)$ can be represented in the form $F(z) = \frac{1}{2\pi i}\int_C \Phi(z\xi)f(\xi)d\xi$ (where $f(\xi)$ outside K is regular and where the contour C contains all singular points of $f(\xi)$) $F(z) = \sum_{n=0}^{\infty} L_n(F)P_n(z)$ applies. There are 5 Slavic references.

ASSOCIATION: Department for applied mathematics of the Mathematical Institute imeni V.A.Steklov AN USSR (Otdeleniye prikladnoy matematiki Matematicheskogo instituta imeni V.A.Steklova Akademii nauk SSSR)

PRESENTED: January 18, 1957 by M.V.Keldysh, Academician

SUBMITTED: January 17, 1957

AVAILABLE: Library of Congress

Card 2/2

to zero.

3. For sufficiently large n $P_n(z)$ has in $r_n \leqslant |z| \leqslant R_n$ exactly k_1 zeros $\lambda_{-1}^{(n)},\dots,\lambda_{-k_1}^{(n)}$ and in $\varrho_n \leqslant |z| \leqslant r_n$ exactly k_2 zeros $\lambda_1^{(n)},\dots,\lambda_{k_2}^{(n)}$, where $\lambda_i \neq \lambda_j$ for $i \neq j$.

4. Let denote $P_{n,m}(z) = \frac{P_n(z)}{z-\lambda_m^{(n)}}$. Then let be

$$\lim_{n\to\infty} \frac{P_{n+1,i}\left(\lambda_i^{(n)}\right)}{P_{n+1,i}\left(\lambda_i^{(n+1)}\right)} = 1 \qquad \sum_{n=1}^{\infty} \left| \beta_{ij}(n+1) - \beta_{ij}(n)\right| < \infty$$

$$\sum_{n=1}^{\infty} \left|\gamma_{ij}(n)\right| < \infty \qquad i \neq j$$

where

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$$\beta_{ij}(n) = \frac{P_{n+1,j}\left(\lambda_j^{(n)}\right)}{\lambda_j^{(n)}\, P_{n+1,j}\left(\lambda_j^{(n)}\right)}\,, \quad \gamma_{ij}(n) = \lambda_j(n)\beta_{ij}(n)\,\beta_{ji}(n)$$

Let A denote the matrix $(\alpha_{ij})_1^{\infty}$, $\alpha_{ij} = a_{i-j}^{(i)}$ and $Y = \{y_1, y_2, \ldots\}$ the solution of the system

$$(1) \quad AY = F\,, \quad F = \{f_1, f_2, \ldots\}\,, \quad f_n = 0\,,\ n > n_1$$

(1) is assumed to possess a solution for each F of the above type. Then it holds the following theorem.

Theorem : An arbitrary solution of (1) satisfying the condition

$$y_n = 0((1-\varepsilon)^n R_1 \ldots R_n)$$

(where $\varepsilon > 0$ may be arbitrarily small) has the form

$$y_n = C_{-1}\, y_{-1,n} + \ldots + C_{-k_1}\, y_{-k_1,n} + b_1 y_{1,n} + \ldots + b_{k_2} y_{k_2,n} + 0((1+\varepsilon)^n \rho_1 \ldots \rho_n)$$

On the Asymptotic Behavior of the Solutions of Linear Systems of Equations SOV/20-121-3-3/47

where $C_1, \ldots, C_{k_1}$ are arbitrary constants and $b_1, \ldots, b_{k_2}$ are constants depending on F and

$$y_{m,n} \sim \mu_m^{(1)} \mu_m^{(2)} \cdots \mu_m^{(n)}, \quad \mu_m^{(n)} = \lambda_m^{(n)} \frac{P_{n+1,m}\left(\lambda_m^{(n)}\right)}{P_{n+1,m}\left(\lambda_m^{(n+1)}\right)}$$

Before this fundamental theorem the author gives statements on two similar but simpler cases. Finally he formulates a continuous analogue of the theorem with respect to integral equations.

PRESENTED: March 19, 1958, by M.V. Keldysh, Academician

SUBMITTED: March 15, 1958

Card 4/4

KHUA LO-KEN [Hua Lo-kêng]; YEVGRAFOV, M.A. [translator]; GRAYEV, M.I., red.; SHIROKOV, F.V., red.; REZOUKHOVA, A.G., tekhn.red.

[Harmonic analysis of functions of several complex variables in classical domains] Garmonicheskii analiz funktsii mnogikh kompleksnykh peremennykh v klassicheskikh oblastiakh. Pod red. M.I.Graeva. Moskva, Izd-vo inostr.lit-ry, 1959. 163 p. Translated from the Chinese. (MIRA 13:4)

(Functions of complex variables)

IEVGRAFOV, M. A.

16(0) PHASE I BOOK EXPLOITATION SOV/3177

Matematika v SSSR za sorok let, 1917-1957. tom 1: Obzornyye stat'i (Mathematics in the USSR for Forty Years, 1917-1957). Vol 1: Review Articles) Moscow, Fizmatgiz, 1959. 1002 p. 5,500 copies printed.

Eds: A. G. Kurosh, (Chief Ed.), V. I. Bityutskov, V. G. Boltyanskiy, Ye. B. Dynkin, G. Ye. Shilova, and A. P. Yushkevich; Ed. (Inside book): A. P. Lapko; Tech. Ed.: S. N. Akhlamov.

PURPOSE: This book is intended for mathematicians and historians of mathematics interested in Soviet contributions to the field.

COVERAGE: This book is Volume I of a major 2-volume work on the history of Soviet mathematics. Volume I surveys the chief contributions made by Soviet mathematicians during the period 1917-1957; Volume II will contain a bibliography of major works since 1917 and biographic sketches of some of the leading mathematicians. This work follows the tradition set by two earlier works: Matematika v SSSR za pyatnadtsat' let (Mathematics in the USSR for 15 Years) and Matematika v SSSR za tridtsat' let (Mathematics in the USSR for 30 Years). The book is divided into the major divisions of the field, i.e., algebra, topology, theory of probabilities, functional analysis, etc., and contributions and outstanding problems in each discussed. A listing of some 1400 Soviet mathematicians is included with references to their contributions in the field.

16(1)

AUTHOR: Yevgrafov, M.A. SOV/20-126-3-5/69

TITLE: On Theorems Analogous to Phragmen-Lindelöf's Theorem

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 3, pp 478-481 (USSR)

ABSTRACT: Let the operator $A(x,\lambda) = \sum_{k=0}^{n} A_k(x)\lambda^k$, $0 \leqslant x < \infty$, in the metric space H satisfy the conditions

1) For all $x \geqslant 0$ and all λ of $\alpha < \mathrm{Re}\lambda < \beta$ (an exception of finitely many $\lambda_1(x),\dots,\lambda_m(x)$ is admitted) let exist a bounded $A^{-1}(x,\lambda)$. The subspaces $H_s(x)$ which are annihilated by $A(x,\lambda_s(x))$ are finite-dimensional and the projection of $A(x,\lambda_s(x))$ into $H/H_s(x)$ has a bounded inverse operator.

2) There exist $\lim\limits_{x\to\infty} \lambda_s(x) = \lambda_s$ and in the direct sum of the $H_s(x)$ a base $\varphi_{sp}(x)$ can be chosen so that $\lim\limits_{x\to\infty} \varphi_{sp}(x) = \varphi_{sp}$; $\lim\limits_{x\to\infty} A(x,\lambda_s(x))\varphi_{sp}(x) = \lambda_s\varphi_{sp}$, where the φ_{sp} are linearly independent.

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3) $A^{-1}(x,\lambda)A(t,\lambda)$, $0 \leqslant t < \infty$ is bounded for $\lambda \neq \lambda_s(x)$ and

$$\lim_{x\to\infty} \frac{1}{|x-t|} \| A^{-1}(x,\lambda)A(t,\lambda) - E \| = 0$$

uniformly in λ in the strip $\alpha+\varepsilon \leqslant \mathrm{Re}\,\lambda \leqslant \beta - \varepsilon$, where the circles $|\lambda - \lambda_s| < \varepsilon$ are cut out, $\varepsilon > 0$ arbitrary and uniform in t, $0 \leqslant t < \infty$.

Theorem: If these conditions are satisfied, then every solution of $A(x, \frac{d}{dx})u(x) = 0$, $u \in H$ satisfying the condition $\| u(x) \| < Me^{(\beta-\delta)x}$, $\delta > 0$, can be represented as follows:

$$u(x) = v(x) + \sum_{s=1}^{m} \sum_{p=1}^{p_s} C_{sp}\, u_{sp}(x),$$

where $\| v(x) \| < M_\varepsilon e^{(\alpha+\varepsilon)x}$ for every $\varepsilon > 0$, and the $u_{sp}(x)$ are certain determined solutions for which

$$\overline{\lim_{x\to\infty}} \frac{1}{x} \ln \| u_{sp}(x) \| = \mathrm{Re}\,\lambda_s .$$

On Theorems Analogous to Phragmen-Lindelöf's Theorem SOV/20-126-3-5/69

Under a further assumption, in theorem 2 the formula

$$u_{sp}(x) = (\varphi_{sp} + \varepsilon_{sp}(x))\exp\left[\int_0^x \lambda_s(t)dt\right], \quad \|\varepsilon_{sp}(x)\| \to 0, \ x \to \infty$$

is given.
Two further theorems contain concrete applications of the first two theorems.
The first theorems generalize results of Ye.M.Landis and P.Lax.
There are 6 references, 5 of which are Soviet, and 1 American.

PRESENTED: February 17, 1959, by M.V.Keldysh, Academician

SUBMITTED: February 16, 1959

Card 3/3

LIDSKIY, Viktor Borisovich; OVSYANNIKOV, Lev Vasil'yevich; TULAYKOV, Anatoliy Nikolayevich; SHABUNIN, Mikhail Ivanovich. Prinimali uchastiye: ABRAMOV, A.A.; BOCHEK, I.A.; YEVGRAFOV, M.A.; ZYKOV, A.A.; KARABEGOV, V.I.; KARIMOVA, Kh.Kh.; KUDRYAVTSEV, L.D.; KUTASOV, A.D.; SHURA-BURA, M.R.; SHCHEGLOV, M.P. SOLODKOV, V.A., red.; KRYUCHKOVA, V.N., tekhn.red.

[Problems in elementary mathematics] Zadachi po elementarnoi matematike. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1960. 463 p. (MIRA 14:1)

(Mathematics--Problems, exercises, etc.)

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S/020/60/134/002/029/041XX
C 111/ C 333

AUTHORS: Yevgrafov, M. A., Cheyis, J. A.

TITLE: Extension of Phragmen-Lindelöf's Theorem on Analytic Functions to Harmonic Functions in Space

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 2, pp. 259-262

TEXT: Theorem 1: Let $u(r, \varphi, x)$ be a harmonic function in the cylinder $r \leqq a$, $0 \leqq \varphi < 2\pi$, $-\infty < x < \infty$. If the conditions

(1) $u(a, \varphi, x) = 0$, $\left| \frac{\partial u}{\partial r}(a, \varphi, x) \right| < c$

(2) $\max_{(r, \varphi)} |u(r, \varphi, x)| < c \exp e^{\pi |x| / (2+\varepsilon) a}$, $\varepsilon > 0$

are satisfied, then $u(r, \varphi, x) \equiv 0$.

Theorem 2: Let $u(r, \theta, \varphi)$ be a harmonic function in the cone $0 < r < \infty$, $0 \leqq \varphi < 2\pi$, $0 \leqq \theta \leqq \theta_0 < \pi$.
If

(1') $u(r, \theta_0, \varphi) = 0$ $\left| \frac{\partial u}{\partial \theta}(r, \theta_0, \varphi) \right| < c$

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Extension of Phragmen-Lindelöf's Theorem on Analytic Functions to Harmonic Functions in Space

(2') $\max\limits_{(\theta,\varphi)} \left| u(r, \Theta, \varphi) \right| < c \exp\left(r + \frac{1}{r}\right)^{\pi/2\theta_0 - \varepsilon}, \quad \varepsilon > 0$

are satisfied, then $u(r, \Theta, \varphi) \equiv 0$.

The proofs are based on: Theorem 3: Let $F(z) = \sum\limits_{n=1}^{\infty} a_n e^{\lambda_n z}$ be an entire function and

(3) $|a_n|^{1/n} < \frac{c}{n^{2+\varepsilon}}, \quad \varepsilon > 0$

(4) $\lim\limits_{n\to\infty} \frac{n}{\lambda_n} = \alpha, \; 0 < \alpha < \infty \; . \; \lambda_n > 0$

If there $|F(x)| < c, \; -\infty < x < \infty$, then $F(z) \equiv 0$. The proof of theorem 3 is based on:

Lemma 1: If

(6) $|F(t)| < c\, e^{-\delta|t|}, \; -\infty < t < \infty, \; 0 < \delta < \varrho$,

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C 111/ C 333

Extension of Phragmen-Lindelöf's Theorem on Analytic Functions to Harmonic Functions in Space

then $F_\varrho(x + iy)$ is regular in

(7) $-\infty < x < \infty$. $|y| \leqq \pi/2\varrho - \eta$, $\eta > 0$

and satisfies there the inequality

(8) $|F_\varrho(x + iy)| < c\, e^{-\delta|x|}$.

Lemma 2: If $F(z) = \sum_{n=1}^{\infty} a_n e^{\lambda_n z}$ is an entire function, and if (3), (4) are satisfied, while $\varrho > 1/(2+\varepsilon)\alpha$, then

(9) $F_\varrho(z) = \sum_{n=1}^{\infty} a_n \Gamma\left(\frac{\lambda_n}{\varrho} + 1\right) e^{\lambda_n z}$.

Lemma 3: Let $f(t + i\lambda)$ be regular in $|\lambda| \leqq \gamma$, $-\infty < t < \infty$, and assume that it satisfies there the inequality $|f(t + i\lambda)| < c\, e^{-\delta|t|}$. Then for the function $\varphi(z) = \int_{-\infty}^{\infty} f(t)\, e^{-tz} dt$ regular in $|\mathrm{Re}\, z| < \delta$ it holds the

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Extension of Phragmen-Lindelöf's Theorem on Analytic Functions to Harmonic Functions in Space

estimation $|\varphi(iy)| < c\, e^{-\gamma|y|}$.

Lemma 4: Let denote

(10) $G_\varrho(z) = \prod_{n=1}^{\infty}\left(1 - \frac{z^2}{\lambda_n^2}\right) \int_{-\infty}^{\infty} F_\varrho(t)\, e^{-tz} dt, \quad \varrho > \frac{1}{(2+\varepsilon)\alpha}$.

The function $G_\varrho(z)$ is analytically continuable into the semiplane Re $z \geq 0$ and satisfies there the inequalities

(11) $|G_\varrho(iy)| < c\, e^{\pi|y|\left(\alpha - \frac{1}{2\varrho} + \varepsilon_\varrho\right)}$ ($\varepsilon_\varrho > 0$ arbitrary)

(12) $|G_\varrho(z)| < c\, e^{b|z|}$.

S. N. Mergel'yan is mentioned in the paper. There are 4 references: 2 Soviet, 1 English and 1 American.

PRESENTED: May 3, 1960, by M. V. Keldysh, Academician

SUBMITTED: April 28, 1960

Card 4/4

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S/020/60/134/003/021/033XX
C 111/ C 333

AUTHORS: Arshon, J. S., Yevgrafov, M. A.

TITLE: Evaluation of the Growth of a Solution to a System Defined by Heterogeneous Conditions at the Boundary and Phragmen-Lindelöf's Theorems

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 3, pp. 507-510

TEXT: Let the system

(1) $\frac{\partial u}{\partial y} = A\frac{\partial u}{\partial x} + Pu$, $B_1u(x,0) + B_2u(x,1) = f(x)$,

be given, where A, P, B_1, B_2 are matrices of order n and u and f are vectors. 1.) The matrix A is assumed to possess no purely real eigenvalues; 2.) let E^+ and E^- be projection operators onto the sum of the invariant subspaces of A which correspond to the eigen-values a_k for which Im $a_k > 0$ or Im $a_k < 0$; here let

(2) $\det(B_1E^+ + B_2E^-) \neq 0$, $\det(B_1E^- + B_2E^+) \neq 0$;

3.) let

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Evaluation of the Growth of a Solution to a System Defined by Heterogeneous Conditions at the Boundary and Phragmen-Lindelöf's Theorems

(4) $\|f(x) - f(s)\| < |x - s|^{\alpha} \; (\varphi(x) + \varphi(s)), \quad \alpha > 0$

where

$$\varphi(x) > 0 \, , \quad \lim_{x \to +\infty} \frac{\varphi'(x)}{\varphi(x)} = 0 .$$

Theorem 1: If det $(B_1 + B_2 e^{P+zA})$ possesses no purely imaginary zeros, then there exists a solution $u_o(x,y)$ of

(1) for which $u_o(x,y) = O(\varphi(x) + \|f(x)\|)$

Theorem 2: If p is the greatest multiplicity of the purely imaginary zeros of $\det (B_1 + B_2 e^{P+zA})$

then there exists a solution of

(1) for which $u_o(x,y) = O(\varphi(x) + \|f(x)\| + x^{P-1} \int_0^x \|f(t)\| \; dt)$

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Evaluation of the Growth of a Solution to a System Defined by Heterogeneous Conditions at the Boundary and Phragmen-Lindelöf's Theorems

Theorem 3: If $\det (B_1 + B_2 e^{P+zA})$ possesses a simple zero $z = i\lambda_o$, then (1) has a solution

$$u_o(x,y) = e^{Py + i\lambda_o(x+Ay)}\, G_o \int_0^x e^{-i\lambda_o t} f(t)\, dt + O(\varphi(x) + \|f(x)\|)$$

where G_o is a certain constant matrix of rank 1.

By connecting the theorems 1-3 with the results of (1) the author obtains Phragmen-Lindelöf theorems for (1), e. g.

Theorem 4: If $\det (B_1 + B_2 e^{P+zA})$ has no zeros in $0 \leq \operatorname{Re} z < \beta$, and if $u(x,y)$ is a solution of (1) satisfying the condition

$$u(x,y) = O(e^{\beta x}) \; ; \; x \to \infty$$

then it is $u(x,y) = O(\varphi(x) + \|f(x)\|)$.

The proof of the theorems 1-3 is based on the estimation of

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Evaluation of the Growth of a Solution to a System Defined by Heterogeneous Conditions at the Boundary and Phragmen-Lindelöf's Theorems

$\|M(z,y)\|$ and $\|K(x,y)\|$, where $M(z,y) = e^{(P+zA)y}(B_1+B_2e^{P+zA})^{-1}$, $K(x,y)$ is a certain curve integral of $M(z,y)\ e^{zx}$, as well as on the consideration of the residuum of $M(z,y)\ e^{zx}$ in the pole $z = z_n$.

There is 1 Soviet reference.

PRESENTED: May 3, 1960, by M. V. Keldysh, Academician

SUBMITTED: April 28, 1960

Card 4/4

IEVGRAFOV, M.A.

Structure of solutions of exponential increase for some operator equations. Trudy Mat. inst. no.60:145-180 '61.
(MIRA 14:10)

(Differential equations, Partial)
(Operators (Mathematics))

YEVGRAFOV, M.A.

Interpolation problem. Izv. AN SSSR. Ser. mat. 26 no.1:79-86 Ja-F '62. (MIRA 15:2)

(Sequences (Mathematics))

ARSHON, I.S.; YEVGRAFOV, M.A.

Growth of functions which are harmonic within a cylinder and bounded on its surface together with their normal derivative. Dokl. AN SSSR 142 no.4:762-765 F '62. (MIRA 15:2)

1. Predstavleno akademikom M.V.Keldyshem.
(Harmonic functions)

ARSHON, I.S.; YEVGRAFOV, M.A.

Instance of a function which is bounded outside a circular cylinder and is harmonic everywhere in space. Dokl. AN SSSR 143 no.1:9-10 Mr '62. (MIRA 15:2)

1. Predstavleno akademikom M.V.Keldyshem.
(Harmonic functions)

YEVGRAFOV, Marat Andreyevich; KOPYLOVA, A.N., red.; PLAKSHE, L.Yu., ~~tekhn. red.~~

[Asymptotic estimations and integral functions]Asimptoticheskie otsenki i tselye funktsii. Izd.2., perer. Moskva, Fizmatgiz, 1962. 199 p. (MIRA 15:10)
(Functions, Entire)

PHASE I BOOK EXPLOITATION SOV/6263

Yevgrafov, Marat Andreyevich

Asimptoticheskiye otsenki i tselyye funktsii (Asymptotic Estimates and Entire Functions). 2d ed., rev. Moscow, Fizmatgiz, 1962. 200 p. 8000 copies printed.

Ed.: A. N. Kopylova; Tech. Ed.: L. Yu. Plakshe.

PURPOSE: This book is intended primarily for mathematicians engaged in the study of entire functions, as well as for scientific personnel of other related sciences.

COVERAGE: General laws and fundamentals of the theory of entire functions are presented. Methods used for obtaining the asymptotic estimates are described. Estimates of some particular classes of entire functions are derived. The author thanks Ye. B. Vul and I. S. Arshon for reading the manuscript. Some references are mentioned in the text, but there are no references at the end of the book.

Card 1/4

YEVGRAFOV, M.A.

A uniqueness problem for Dirichlet series. Usp.mat.nauk 17 no.3:169-175 My-Je '62. (MIRA 15:12)
(Series, Dirichlet's)

YEVGRAFOV, M.A.

On the structure of Dirichlet series bounded at the real axis. (MIRA 15:12)
Usp.mat.nauk 17 no.5:123-127 S-O '62.
(Series, Dirichlet's)

ARSHON, I. S.; YEVGRAFOV, M. A.

On the growth of harmonic functions of three variables. Dokl. AN SSSR 147 no.4:755-757 D '62. (MIRA 16:1)

1. Predstavleno akademikom M. V. Keldyshem.

(Harmonic functions)

YEVGRAFOV, M.A.

New formula in variational calculus. Usp. mat. nauk 18 no.5: 159-160 S-O '63. (MIRA 16:12)

YEVGRAFOV, M.A.

Extension of Phragmén-Lindelöf's theorems for analytic functions to the solutions of other elliptic systems. Izv. AN SSSR. Ser. mat. 27 no.4:843-854 Jl-Ag '63. (MIRA 16:8)

(Functions, Analytic)
(Differential equations)

YEVGRAFOV, Marat Andreyevich; ZARUTSKAYA, V.V., red.

[Analytic functions] Analiticheskie funktsii. Moskva, Nauka, 1965. 423 p. (MIRA 18:4)

L 13004-66 EWT(d)/T IJP(c)

ORG: none

known asymptotic solutions of

where λ is a real parameter and p(z) is an entire function in a complex plane z. The main problem considered consists in deriving the algorithm for the analytic continuation of asymptotic solutions of (1) from the domain of the z plane, in which the solution is known, into the entire z plane. ... divided into two problems. 1) ... 2) Algebraic problem.

transfer matrices ... formulas are obtained for the solutions of the more general equation

$$\ldots \lambda^2 u(z) = 0 \qquad (2)$$

... formulas ...

ORIG REF: 013 OTH REF: ... ATD PRESS: 4213

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ACC NR: AP6015600 SOURCE CODE: UR/0020/66/168/002/0262/0265

26

B

AUTHOR: Yevgrafov, M. A.

ORG: none

TITLE: The asymptotic properties of the resolvent of an integral equation with a kernel which is a function only of the differences between variables

SOURCE: AN SSSR. Doklady, v. 168, no. 2, 1966, 262-265

TOPIC TAGS: Euclidean space, asymptotic property, integral equation, vector function, Fourier transform, orthogonal function

ABSTRACT: The integral equation

$$y(P)+\lambda\int_{D_\rho} K(P-Q)y(Q)\,d\sigma_Q = f(P) \quad (P\in D_\rho),$$

where P and Q are vectors and $d\sigma$ is the volume element of space R, is examined. D is a finite domain of the n-dimensional Euclidean space R. For any $\rho > 0$ and $\lambda > 0$

$$\Gamma_\rho^{(1)}(P, P; \lambda) \leqslant \Gamma^{(1)}(0; \lambda) = (2\pi)^{-n}\int_R \frac{a^2(S)}{1+\lambda a(S)}\,d\sigma_S,$$

and when $\rho \to +\infty$ at fixed $\lambda > 0$,

$$\int_{D_\rho} \Gamma_\rho^{(1)}(P, P; \lambda)\,d\sigma_P \sim \frac{V(D_\rho)}{(2\pi)^n}\int_R \frac{a^2(S)}{1+\lambda a(S)}\,d\sigma_S$$

UDC: 517.4+517.5+517.9

Card 1/2

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($V(D\,P)$ is the volume of domain $D\,P$). If $\psi_\gamma(P, Q; \lambda)$ is the resolvent of the original integral equation and

$$\psi_\gamma^{(2)}(P, Q; \lambda) = \frac{1}{\lambda}\left[|P-Q|^{-\gamma} - \psi_\gamma(P, Q; \lambda)\right];\ N_\gamma(t)$$

is the number of eigenvalues of the equation that lie on the segment (-t, 0), then the following asymptotic formulas are valid:

$$\int_D \psi_\gamma^{(2)}(P, P; \lambda)\, d\sigma_p \sim$$

$$\sim \frac{\pi}{(n-\gamma)\sin \pi\gamma/(n-\gamma)}\ 2^{-\gamma}\pi^{-n/2}\frac{\Gamma((n-\gamma)/2)}{\Gamma(\gamma/2)}\Omega_n \lambda^{\gamma/(n-\gamma)-1} V(D) \quad (\lambda \to +\infty),$$

$$N_\gamma(t) \sim \frac{1}{\pi}\cdot 2^{-\gamma}\pi^{-n/2}\frac{\Gamma((n-\gamma)/2)}{\Gamma(\gamma/2)}\Omega_n t^{n/(n-\gamma)} V(D) \quad (t \to +\infty),$$

where Ω_n is the area of a unit sphere in R. This paper was presented by Academician M. V. Keldysh on 31 August 1965. Orig. art. has: 39 formulas.

SUB CODE: 12/ SUBM DATE: 17Aug65/ ORIG REF: 001

Card 2/2 gd

KOLGANOV, V.I.; SURGUCHEV, M.L.; YEVGRAFOV, N.A.

Results of the study of oil recovery from layer B_2 of the Zol'nyy Ovrag field by zonal water encroachment; water encroachment isochrons. Geol. nefti i gaza 9 no.4:14-19 Ap '65.

(MIRA 18:8)

1. Gosudarstvennyy institut po proyektirovaniyu i issledovatel'skim rabotam neftedobyvayushchey promyshlennosti vostochnykh rayonov strany, Kuybyshev.

YEVGRAFOV, N.M.; KRIVITSKIY, M.Z.

Mechanization of the painting of transformer radiators. Lakokras. mat.i ikh prim. no.2:67-69 '62. (MIRA 15:5)
(Painting, Industrial--Equipment and supplies)

YEVGRAFOV, N.M.; KRESTAN, N.N.; PLAKSIN, B.V.; SHAPIRO, G.I.

Automation of the painting of gondola cars. Lakokras.mat. i ikh prim. no.2:57-62 '63. (MIRA 16:4)
(Railroads—Freight cars—Painting) (Automation)

YEVGRAFOV, N.M.; MORDUKHOVICH, G.A.

EKT electric heater used in drying lacquer and paint coatings. Lakokras. mat. i ikh. prim. no.4:49-53 '61. (MIRA 16:7)

1. Proyektnoye byuro Gosudarstvennoy vsesoyuznoy proizvodstvennoy kontory po lakokrasochnym pokrytiyam Glavkhimplastkraski Ministerstva khimicheskoy promyshlennosti SSSR.
(Protective coatings—Drying)

STEPANOV, V.P.; YEVGRAFOV, N.S.; ANDREYEV, V.B.

Some results of surface magnetometric work in the Tatar A.S.S.R.
Geol. nefti i gaza 5 no.11:56-59 N '61. (MIRA 14:11)

1. Kazanskaya ekspeditsiya tresta Tatneftegeofizika.
(Tatar A.S.S.R.--Magnetic prospecting)

S/169/62/000/005/030/093
D228/D307

AUTHORS: Stepanov, V. P., Yevgrafov, N. S. and Andreyev, V. B.

TITLE: Some results of ground magnetometer operations on the territory of Tatariya

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 5, 1962, 32, abstract 5A254 (Geol. nefti i gaza, no. 11, 1961, 56-59)

TEXT: The results of magnetometer investigations in south- and north-easterly districts of the Tatar ASSR and in adjoining regions are described. The aim was to detail previously exposed anomalies, to interpret them geologically, and to zone them tectonically. A map of the crystalline basement's relief was constructed as a result of both quantitative calculations by the simplest methods and the consideration of drilling data. [Abstracter's note: Complete translation.]

Card 1/1

[illegible]

Kazan. fil. AN [illegible]. Ser. geol. nauk [illegible]. (MIRA 18:6)

YEVGRAF[illegible], N.S.

Study of the subsurface structure of the northern dome of the [illegible] -ving. Izv. Kazan. fil. [illegible] Ser. ge[illegible]

[illegible]

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R001963010009-2"

YEVGRAFOV, V.; AVIKSON, Yu.

Unit for the chemical cleaning of sheet steel. NTO no.8:27 Ag '59.
(MIRA 12:11)

1. Predsedatel' soveta pervichnoy organizatsii Nauchno-tekhnicheskogo obshchestva Leningradskogo sudostroitel'nogo zavoda (for Yevgrafov).
2. Uchenyy sekretar' soveta pervichnoy organizatsii Nauchno-tekhnicheskogo obshchestva Leningradskogo sudostroitel'nogo zavoda (for Avikson).
(Leningrad--Sheet steel)

YEVGRAFOV, V.A., inzh.

Calculation of aeration systems. Trudy LIVT no.68: 5-22 '64. (MIRA 18:11)

YEVGRAFOV, V.A.

Relationship between the airgap and porosity of disperse media.
Inzh.-fiz.zhur. 6 no.10:112-114 O '63. (MIRA 16:11)

1. Institut vodnogo transporta, Leningrad.

YEVGRAFOV, V.A.

Stochastic determination of the structure of a dispersed medium. Inzh.-fiz. zhur. no.10:121-127 O '64. (MIRA 17:11)

1. Institut vodnogo transporta, Leningrad.

YEVGRAFOV, V.L.

Method of temporary unilateral occlusion of the pulmonary artery and bronchus, Khirurgiia no.1:85-90 '63. (MIRA 17:5)

1. Iz 2-y kafedry khirurgii (zav. - prof. B.K. Osipov) TSentral'nogo instituta usovershenstvovaniya vrachey, Moskva.

YEVGRAFOV, V.L.

Temporary unilateral bronchovascular occlusion in surgery of the lungs. Trudy TSIU 66:97-107 '64.

Use of the "sail" phenomenon in conducting the catheter through the chambers of the heart. Ibid.:108-113 (MIRA 18:5)

YEVGRAFOV, V.L.

Partial avulsion of the pancreas in a blunt abdominal injury. Khirurgiia 39 no.5:122-123 My '63. (MIRA 17:1)

1. Iz Brasovskoy rayonnoy bol'nitsy (glavnyy vrach V.L. Yevgrafov) Bryanskoy oblasti.

YEVGRAFOV, YU. P.

CA

10

2-Methyl-α-naphthindole and some of its transformations. I. A. Kuznyants and Yu. P. Evgrafov. *J. Gen. Chem.* (U. S. S. R.) 10, 1733-6(1940).—2-Methylnaphthindole (5.4 g.), 7 g. MeI and 7 ml. abs. MeOH, heated in a sealed tube for 48 hrs. at 101-8°, yield 88% *1,2,3,3-tetramethyl-α-naphthindolenine iodide* (I), m. 230-1° (from EtOH). I (0.35 g.), 3 ml. dry pyridine and 0.15 g. $HC(OEt)_3$ at 130-5° for 4 hrs. yield 80% *bis(1,3,3-trimethyl-α-naphthindolenine)carbocyanine iodide* (II), green, m. 245-6°. II has an absorption max. at 600 mμ. Iso-PrCOMe (10 g.) and 15 g. $1\text{-}C_{10}H_7NHNH_2$ refluxed on a steam bath 20 min., treated with H_2O, extd. with Et_2O, the latter concd. and the residue heated with twice its wt. of $ZnCl_2$ at 175-80°, ground with dil. HCl, extd. with Et_2O, the Et_2O distd. off and the residue heated with MeI at 106-8° for 3 hrs. yields I. I (4.2 g.) in 30 ml. H_2O treated with 50 ml. 20% NaOH, extd. with Et_2O, and the Et_2O distd., leaves a residue of *1,3,3-trimethyl-2-methylene-α-naphthindolenine*, green, m. 43-5°. I (0.35 g.), 0.2 g. $p\text{-}Me_2NC_6H_4CHO$, 5 ml. EtOH and 1 drop of piperidine were heated on a steam bath 2 hrs. On cooling *2-p-dimethylaminostyryl-1,3,3-trimethyl-α-naphthindolenine iodide* sepd., green, decomp. 200-10° (from EtOH), absorption max. at 578 mμ. G. M. Kosolapoff

METALLURGICAL LITERATURE CLASSIFICATION

DANILINA, Ye.G.; YEVGRAFOVA, G.A.

"Geography and the economy." Collection 7, 1960. Reviewed by E.G.Danilina, G.A.Evgrafova. Vop. geog. no.54:154-156 '61. (MIRA 15:3)

(Agriculture)

AMINOV, Mangim Shakurovich; KURSHEV, N.V., prof., otv.red.; YEVGRAFOVA, L.N., otv. za vypusk

[Some problems in the motion and stability of a solid of variable mass] Nekotorye voprosy dvizhenia i ustoichivosti tverdogo tela peremennoi massy. Kazan', 1959. 116 p. (Kazan. Aviatsionnyi institut. Trudy, vol. 48) (MIRA 14:2)

(Solids—Dynamics)

MATROSOV, V.M.; KUZ'MIN, P.A., doktor fiz.-matem.nauk, otv.red.; YEVGRAFOVA, L.N., otv.za vypusk

[Stability of gyroscopic systems] K voprosu ustoichivosti giroskopicheskikh sistem. Kazan', 1959. 23 p. (Kazan. Aviatsionnyi institut. Trudy, vol.49) (MIRA 14:2)
(Gyroscope)

MATVEYEV, G.A.; YEVGRAFOVA, L.N., otv.za vypusk; KURSHEV, N.V., prof.otv.red.; VAKHITOV, M.B., kand.tekhn.nauk, dotsent, red.; GALIULLIN, A.S., doktor, tekhn.nauk, red.; MITRYAYEV, M.I., kand.tekhn.nauk, dotsent, red.; RADTSIG, Yu.A., doktor tekhn.nauk, prof., red.; FEDOROV, A.K., kand.tekhn.nauk, dotsent, red.

[A method for generating tooth surfaces of hyperbolical gears] Odin iz sposobov obrazovaniia poverkhnostei zub'ev giperboloidnykh koles. Kazan' 1960. 23 p. (Kazan. Aviatsionnyi institut. Trudy, no.60). (MIRA 15:3)

(Gearing, Bevel)

RADTSIG, Yury Antonovich, prof., doktor tekhn.nauk; YEVGRAFOVA, L.N., otv. za vypusk

[Statically indeterminate minimum-volume trusses] Staticheski neopredelimye fermy naimen'shego ob"ema. Kazan', 1960. 107 p. (Kazan. Aviatsionnyi institut. Trudy, vol. 51) (MIRA 14:2)

(Trusses)

KRYLOV, B.L.; YEVGRAFOVA, L.N., otv. za vyp.

[Fundamentals of operational calculus] Osnovy operatsionnogo ischisleniia; uchebnoe posobie dlia aviatsionnykh institutov. Izd.2., perer. Kazan', Kazanskii aviatsionnyi in-t, 1961. 50 p. (MIRA 16:11)
(Calculus, Operational)

YEVGRAFOVA, M.K., inzh.; IL'YASHEVICH, V.A., inzh.; VOL'NOVA, Z.G., nauchn. red.; BABAKOV, A.N., red.

[Continuous action equipment for the bleaching of cotton cloth and knitted fabrics] Oborudovanie nepreryvnogo deistviia dlia otbelki khlopchatobumazhnoi tkani i trikotazhnogo polotna. Moskva, 1963. 39 p. (Seriia III: Novye mashiny, oborudovanie i sredstva avtomatizatsii, no.67)
(MIRA 17:7)

1. Moscow. TSentral'nyy institut nauchno-tekhnicheskoy informatsii po avtomatizatsii i mashinostroyeniyu. 2. Vsesoyuznyy nauchno-issledovatel'skiy institut legkogo i tekstil'nogo mashinostroyeniya (for Il'yashevich).

YEVGRAFOVA, M.K.

The RM-186-Sh teasing machine. Biul.tekh.-ekon.inform. no.6:43-44 '58. (MIRA 11:8)

(Textile machinery)

YEVGRAFOVA, M.K.

The AZP-186-Sh unit for open-width boiling out and washing worsteds. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch. i tekh.inform. no.4: 55-57 '62. (MIRA 15:7)
(Textile finishing—Equipment ad supplies)

YEVGRAFOVA, N.P. 14

CA

PROCESSES AND PROPERTIES INDEX

Photocolorimetric determination of the color and transparency of water. S. K. Chirkov and N. P. Evgrafova. *Vodosnabzhenie Sanit. Tekh.* 16, No. 1, 25-7(1941).—Photocolorimeter is suitable only for waters of a const. chem. compn., as the indications depend on the light-absorption, and dispersion characteristics of the substances involved. Analyses and tables. B. Gutoff

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YEVGRAFOVA, N. P.

YEVGRAFOVA, N. P.

"Comparative Biochemical Study of the Potato Under Central Asian Conditions in Relation to Selection of the Tubers on the Basis of Their Chemical Composition." Cand Biol Sci, All-Union Inst of Plant Growing, All-Union Order of Lenin Acad Agricultural Sci imeni V. I. Lenin, Leningrad, 1955. (KL, No 8, Feb 55)

SO: Sum. No 631, 26 Aug 55-Survey of Scientific and Technical Dessertations Defended at USSR Higher Educational Institutions (14)

RYZHOV, A.F.; SAL'NIKOVA, A.F.; YEVGRAFOVA, Ye.

We are raising the qualifications of specialists. Zashch.rast.ot vred.i bol. 7 no.6:59 Je '62. (MIRA 15:12)
(Velikiye Luki—Plants, Protection of—Study and teaching)
(Moldavia—Plants, Protection of—Study and teaching)

YEVGRAFOVA, Ye G.

GUSAK, M.I.; BRAGA, P.P.; LARINA, Ye.A.; YEVGRAFOVA, Ye.G.

Finishing of locknit warp fabric by discharge printing. Leg.prom. 16 no.10:49-50 O '56. (MIRA 10:12)

(Textile printing)

VIL'DERMAN, A.M.; FINN, E.R.; YEVGRAFOVA, Z.A.

Compound treatment of pulmonary tuberculosis with antibacterial preparations in combination with corticosteroid hormones, butadione, blood transfusions and tuberculin. Zdravookhranenie 4 no.3:18-22 My-Je'61. (MIRA 16:7)

1. Iz Respublikanskogo tuberkuleznogo sanatoriya "Vornichen" Ministerstva zdravookhraneniya Moldavskoy SSR (glavnyy vrach K.A. Draganyuk).

(TUBERCULOSIS)

VIL'DERMAN, A.M., kand. med. nauk; YEVGRAFOVA, Z.A.; YEZERSKIY, V.F.

Data on the technic of tuberculin diagnosis. Probl. tub. no.7; 36-41 '63. (MIRA 18:1)

1. Iz Respublikanskogo tuberkuleznogo sanatoriya "Vornicheny" (glavnyy vrach K.A. Draganyuk) Ministerstva zdravookhraneniya Moldavskoy SSR.

GAMBURG, A.L.; YEVGRANOVA, V.G.; LOGUTOV, G.F.; RYAZANSKIY, B.V.

Treatment of alcoholism with antethyl. Trudy Gos. nauch.-issl. psikhonevr. inst. no.20:243-247 '59. (MIRA 14:1)

1. Kafedra psikhiatrii Saratovskogo meditsinskogo instituta. Zaveduyushchiy kafedroy - M.P.Kutanin.
(DISULFIDE—THERAPEUTIC USE) (ALCOHOLISM)

YEVGRASHIN, A.A.

Pneumatic devices for automatic control of pressing operations abroad. Avt.prom. 28 no.12:41-42 D '62. (MIRA 16:1)
(Pneumatic control)

YEVGRASHIN, A.A.

Universal pneumatic conveying of band material to the working space of presses. Avt.prom. 29 no.9:39-40 S '63. (MIRA 16:9)

1. Nauchno-issledovatel'skiy institut tekhnologii traktornogo i sel'skokhozyaystvennogo mashinostroyeniya.
(Pneumatic machinery)

SUCHKO, Georgiy Dmitriyevich, inzh.; YEVGRASHIN, Konstantin Fedorovich, inzh.; KREMKOV, Gennadiy Dmitriyevich, inzh.; KUDIKINA, Ye., red.; NIKITINA, V., tekhn. red.

[Trawls and drift nets; a manual for workers of fishing equipment factories and for master fishermen] Traly i drifternye seti; posobie dlia rabochikh fabrik orudii lova, masterov dobychi. Kaliningrad, Kaliningradskoe knizhnoe izd-vo, 1963. 109 p. (MIRA 17:3)

1. Kaliningradskaya fabrika orudiy lova (for Suchko, Yevgrashin, Kremkov).